ALLOWABLE SPANS FOR JOISTS AND RAFTERS 1,7

Lumber Grade		FLOOR JOISTS		CEILING JOISTS 5		RAFTER-CEILING JOIST COMBINATION		RAFTER-CEILING JOIST COMBINATION		RAFTERS 6	
DOUGLAS FIR- LARCH NO.2 OR BETTER Nominal O.C.		Drywall Below ²	No Finish Below ²	Plaster Below ²	Drywall Below ³	Lightweight Roofing; Plaster Below ²	Lightweight Roofing; Drywall Below ³	Tile Roofing; Plaster Below ²	Tile Roofing; Drywall Below ³	Lightweight Roofing ⁴	Tile Roofing ⁴
Size	Spacing	DL = 15 psf	DL = 10 psf	DL = 10 psf	DL = 5 psf	DL = 20 psf	DL = 15 psf	DL = 30 psf	DL = 25 psf	DL = 10 psf	DL = 20 psf
(inches)	(inches)	LL = 40 psf	LL = 40 psf	LL = 10 psf	LL = 10 psf	LL = 20 psf	LL = 20 psf	LL = 20 psf	LL = 20 psf	LL = 20 psf	LL = 20 psf
, ,	12	6 '- 9"	6' - 9"	9' - 9"	12' - 5"	8' - 5"	9' - 6"	7' - 11"	8' - 2"	10' - 10"	9' - 10"
2 x 4	16	6 '- 2"	6′ - 2″	8' - 11"	11' - 3"	7' - 7"	8' - 8"	7' - 3"	7′ - 5″	9' - 10"	8' - 6"
	24	5 '- 3"	5′ - 4″	7' - 9"	9' - 10"	6' - 7"	7' - 4"	6′ - 1″	6' - 5"	8' - 0"	6′ - 11″
2 x 6	12	10' - 8"	10' - 8"	15' - 5"	19' - 6"	13' - 4"	15' - 1"	12' - 7"	12' - 11"	16' - 7"	14' - 4"
	16	9' - 9"	9' - 8"	14' - 0"	17′ - 8″	12' - 1"	13' - 3"	11' - 1"	11' - 8"	14' - 4"	12' - 5"
	24	7' - 8"	8' - 1"	12' - 2"	14' - 10"	10' - 1"	10' - 10"	9' - 0"	9' - 6"	11' - 9"	10' - 2"
	12	13′ -10″	14' - 1"	20' - 3"	25' - 8"	17' - 7"	19′ - 6″	16′ - 3″	17' - 2"	21' - 0"	18' - 2"
2 x 8	16	12' - 0"	12′ - 7″	18′ - 5″	23' - 0"	15' - 9"	16′ - 10″	14' - 1"	14' - 10"	18′ - 2″	15' - 9"
	24	9' - 9"	10' - 3"	16′ - 1″	18' - 9"	12' - 10"	13' - 9"	11' - 5"	12' - 1"	14' - 10"	12' - 10"
2 x 10	12	16′ - 11″	17′ - 9″	25′ - 11″	*	22' - 4"	23′ - 10″	19' - 11"	21′ - 0″	25′ - 8″	22' - 3"
	16	14' - 9"	15′ - 4″	23′ - 6″	*	19′ - 4″	20′ - 8″	17' - 3"	18′ - 2″	22' - 3"	19' - 3"
	24	11' - 11"	12′ - 6″	19' - 10"	22' - 11"	15' - 9"	16′ - 10″	14' - 0"	14' - 10"	18′ - 2″	15' - 8"
2 x 12	12	19' - 7"	20′ - 7″	*	*	25' - 11"	*	23′ - 2″	24' - 5"	*	25' - 9"
	16	17′ - 0″	17′ - 10″	*	*	22' - 5"	24' - 0"	20' - 0"	21' - 1"	25' - 9"	22' - 4"
	24	13′ - 10″	14′ - 6″	23′ - 0″	*	18′ - 3″	19′ - 6″	16′ - 4″	17' - 2"	21' - 0"	18′ - 3″
2 x 14	12	21' - 11"	23′ - 0″	*	*	*	*	25' - 11"	*	*	*
	16	19' - 0"	19′ - 11″	*	*	25′ - 1″	*	22' - 5"	23' - 7"	*	25′ - 1″
	24	15′ - 6″	16′ - 3″	*	*	20′ - 5″	21' - 10"	18′ - 3″	19' - 3"	23' - 7"	20' - 5"

^{*}Span exceeds 26 feet in length. Check sources for availability of lumber in lengths greater than 20 feet.

ALLOWABLE SPANS FOR OPEN BEAM CEILINGS 1, 2, 7

DOUGLAS FIF	r Grade R-LARCH NO.2 ETTER	Lightweight Roofing	Tile Roofing	
Nominal Size	O.C. Spacing	DL = 15 psf	DL = 25 psf	
(inches)	(inches)	LL = 20 psf	LL = 20 psf	
	24	10' - 1"	9' - 6"	
4 x 4	32	9' - 1"	8' - 0"	
	48	7' - 4"	6' - 6"	
	24	15' - 11"	14' - 7"	
4 x 6	32	13′ - 4″	11' - 9"	
	48	10' - 11"	9' - 7"	
	24	21' - 0"	19' - 4"	
4 x 8	32	17' - 8"	15' - 7"	
	48	14' - 5"	12' - 8"	
	24	*	23' - 9"	
4 x 10	32	21' - 9"	19' - 2"	
	48	17' - 8"	15' - 7"	

^{*}Span exceeds 26 feet in length. Check sources for availability of lumber in lengths greater than 20 feet.

Footnotes:

- 1 Used under dry conditions with lumber moisture content less than 16 percent at time of installation
- 2 Deflection based on L/360 (LL) and L/240 (LL + DL)
- 3 Deflection based on L/240 (LL) and L/180 (LL + DL)
- 4 Deflection based on L/180 (LL) and L/120 (LL + DL)
- 5 Unfinished attic above with no storage
- 6 Unfinished attic below

- 7 See PDS #081 for fastening schedule
 8 Equivalent nailing required for ceiling joist to ceiling joist lap splices
 9 Connected members shall be of sufficient size to prevent splitting due to nailing

RAFTER TIE CONNECTIONS

		Roof Span (feet)					
Rafter Slope	Tie Spacing (inches)	12	20	28	36		
		Required number of 16d common nails					
		per connection 8, 9					
	12	4	6	8	10		
	16	5	7	10	13		
3:12	24	7	11	15	19		
	32	10	14	19	25		
	48	14	21	29	37		
	12	3	4	5	6		
	16	3	5	7	8		
4:12	24	4	7	10	12		
	32	6	9	13	16		
	48	8	14	19	24		
	12	3	3	4	5		
	16	3	4	5	7		
5:12	24	4	6	8	10		
	32	5	8	10	13		
	48	7	11	15	20		

5510 OVERLAND AVE., SUITE 110, SAN DIEGO, CA 92123 • (858) 565-5920 • (888) 336-7553 HTTP://WWW.SDCPDS.ORG PAGE 1 of 2

PDS 415 REV: 03/01/2014

ALLOWABLE PLYWOOD SPANS 1

Panel Identification	Plywood Thickness	Edges	Maximum Spans (inches)		
Index 6	(inches)	Edges	Roof	Floor	
12/0	5/16	Blocked	12	0	
12/0	5/16	Unblocked	12	0	
16/0	5/16, 3/8	Blocked	16	0	
10/0		Unblocked	16	0	
20/0	5/16, 3/8	Blocked	20	0	
20/0		Unblocked	20	0	
24/0	3/8, 7/16, 1/2	Blocked	24	0	
24/0		Unblocked	20 4	0	
24/16	7/16, 1/2	Blocked	24	16 ²	
24/10	7/10, 1/2	Unblocked	24	0	
32/16	15/32, 1/2, 5/8	Blocked	32	16 ^{2, 3}	
32/10		Unblocked	28	0	
40/20	19/32, 5/8, 3/4, 7/8	Blocked	40	20 2, 3 5	
40/20		Unblocked	32	0	
48/24	23/32, 3/4, 7/8	Blocked	48	24 ²	
40/24	23132, 314, 110	Unblocked	36	0	

- Footnotes:
 1 Plywood shall be Structural II, Structural II, Standard Sheathing, or CC Exterior grades only and shall be continuous over two or more spans with face grain perpendicular to supports
- 2 Blocking may be omitted if plywood edges have approved tongue and groove joints, if $\frac{1}{2}$ " minimum thickness plywood underlayment is installed, or if finish floor is 3/4" wood strip, or 1 1/2" of approved cellular or lightweight concrete is placed over subfloor
- 3 24" o.c. acceptable if 3/4" wood strip flooring is installed at rights angles to joists
- 4 For 1/2" panel, maximum span shall be 24"
- 5 24" o.c. acceptable for floors where 1 ½" of cellular or lightweight concrete is applies over panels
- 6 Identification index appears on all panel in the construction grades listed in footnote #1

ALLOWABLE LUMBER SHEATHING SPANS

Sheathing ¹	Maximum Spans		
Sheathing	Roof	Floor	
1" Thick Nominal	Solid	32"	16"
I THICK NOTHINAL	Spaced 2, 4	24"	Not Applicable
2" Thick Nominal	Supported Ceiling	6 '- 6" 3	4' - 6"
(Douglas Fir-Larch No. 2 or better)	No Ceiling	8' - 0" 3	4' - 6"

- 1 Spans of sheathing boards placed diagonally across rafters or joists shall be measured along the longitudinal axis of the plank (utility grade not permitted)
- 2 Shall be continuous over three or more supports
- 3 Douglas Fir-Larch No. 3 also permitted
- 4 Merchantable, No.4 Common, and No. 3 not permitted